Section 4.7. Projection Operators

Note. In this section we define "projection operators."

Definition 4.7.1. Let S be a closed subspace of a Hilbert space H. The operator P on H defined as $P(x) = y$ for $x = y + z$ and $y \in S$, $z \in S^{\perp}$ is the *projection operator* onto S (denoted P_S).

Note. Projection operators are bounded linear operators.

Examples. Example 4.7.1 and 4.7.2.

Definition 4.7.2. An operator T is *idempotent* if $T^2 = T$.

Theorem 4.7.1. A bounded operator is a projection operator if and only if it is idempotent and self adjoint.

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